What is claimed is:

1. A polarized total internal reflection illumination optical system by rotary annulus light in which laser beams are introduced into the objective lens of a microscope at the peripheral region, wherein the direction of illumination of laser beams is rotatable and the illumination is performed using s-polarized light that are perpendicular to the radial direction from the center of optical axis of the objective lens at all times.

2. A polarized total internal reflection illumination optical system by rotary annulus light featuring a drive means which rotates the unit that comprise a polarizer to adjust the direction of polarization of the laser beams and a tiltable mirror to form annulus light.

3. A polarized total internal reflection illumination optical system by rotary annulus light in which the laser beams from the laser light source are expanded by a beam expander provided with a spatial filter such that their diameter is increased to up to one half the average diameter of the annulus, and thereafter which the expanded beams are introduced into the rotary polarizer and mirror unit, effectively eliminating the need for the use of an annulus –diaphragm.

4. A polarized total internal reflection illumination optical system by rotary annulus light as stated in any of Claims 1 through 3 in which the laser beams are introduced into the rotary polarizer and mirror unit via a small 45-degree mirror placed at the center of the collector lens, and in which the annulus parallel beams reflected from

said polarizer and mirror unit are collected at the back focal plane of the objective lens via peripheral region of said collector lens.

5. A polarized total internal reflection illumination optical system by rotary annulus light as stated in Claim 4 in which a index pin is placed in front of the front focal plane of said collector lens (i.e., near the field diaphragm plane) and inserted at about the center of the optical axis to detect the period of rotation and direction of vibration of the rotating laser beams in the visual field of the microscope.